**Exploring the Ratio of Dumbbell Press to Flat Bench Press**

**Many weightlifters wish to track the ratio between the weight they use for flat dumbbell press compared to barbell bench press.**

A **dumbbell** is a short bar with equal weight on both sides designed to be held in the lifter's hands. Flat dumbbell press is when the lifter lies on a flat bench with their arms positioned at roughly 45-degree angles, lifts two equal sized dumbbells, brings them back to the chest, and then keeps going.

A **barbell** is similar in shape to a dumbbell, but is a longer, much heavier bar where multiple weighted plates can be placed on either side. Barbell bench press is when the lifter lies on a bench with the barbell positioned at their chest, lifts the barbell, and then brings it back down.

Say Melissa is able to flat dumbbell press two 30 lbs dumbbells. The total amount she can flat dumbbell press is 60 lbs (one dumbbell for each arm). On flat bench press, she can lift 75 lbs. Her ratio would be calculated by dividing flat dumbbell press by barbell bench press (60/75) which equals 0.8, meaning that Melissa can lift two dumbbells up to 80% as heavy as she can bench press the barbell.

A screenshot of a calculator

Description automatically generatedThe goal of the ratio is to compare how much someone is lifting two dumbbells versus how much they are able to lift the weighted barbell. You obtain the ratio by multiplying the weight of one dumbbell by 2 (to account for the two weights that the person would hold) and dividing that weight by the amount someone is able to barbell bench press.

**The data is sourced from a self-reported Reddit open forum[[1]](#footnote-1). Users provided their weight for both a flat dumbbell press and a barbell bench press, and it was compiled by another user into the corresponding weight ratio. It is important to note that as this is a self-reported open forum, biases may be introduced that wouldn't otherwise be present.**

Below is a dataset with observations from 18 weightlifters and their corresponding ratio, as well as summary statistics and a dot plot.

A graph with numbers and dots

Description automatically generated with medium confidence

A screenshot of a cell phone

Description automatically generated

1. Based on the dot plot and the data table, what could be a concern regarding the spread of the data, and what is a possible solution.
2. What potential problems could arise from the way the data was collected?
3. Create a 95% confidence interval for the mean ratio between flat dumbbell press and barbell bench press.
4. Considering your answer in question 2, do you believe that the population mean presented in this confidence interval is reliable? Who would find it to be useful? Explain your answer.
5. We’ve seen that Melissa has a ratio of 0.8. Now, she has a goal to become more “balanced” and have more of an average ratio. What should she do in order to achieve this? Explain both in terms of the ratio and the exercises involved.
6. Suppose you wish to further investigate the strength ratio; how would you go about finding more concrete results and how would that make the data more useful?

1. Reddit Thread: <https://www.reddit.com/r/Fitness/comments/35q4i3/how_much_do_you_dumbbell_flat_bench_compared_to/> [↑](#footnote-ref-1)